CLAIMS

1. A process for reducing the concentration of nitrogen oxides in a stream of combustion gases, comprising:

providing a side stream of gases at a temperature of at least 140°C;

introducing an aqueous solution of urea into said side stream under conditions effective to gasify said aqueous urea;

introducing said side stream of gases containing the gases resulting from the gasification of the urea into a primary stream of NO_x-containing gases of greater volume than the side stream to create a combined gas stream; and

passing the combined gas stream through a NO_x-reducing catalyst under conditions effective to reduce the concentration of NO_x in the combined gas stream.

2. A process according to claim 1, wherein the side stream comprises combustion gases separated from a combustion gas stream to produce said side stream and said primary stream.

3. A process according to claim 1, wherein the side stream comprises outside air.

4. A process according to claim 1, wherein the side stream comprises gases withdrawn from said combined gas stream following their passage through said NO_x-reducing catalyst.

5. A process according to any one of claims 1-4, wherein said side steam of gases is heated to a temperature of at least 200°C prior to introducing the aqueous solution of urea.

6. A process according to any one of claims 1-4, wherein the urea solution is introduced at a rate relative to the NO_x concentration in said combined stream prior to

passage through said NO_x-reducing catalyst effective to provide an NSR of from 0.1 to 2.0.

7. A process according to any one of claims 1-4, wherein the aqueous urea has a concentration of from 5 to 70%.

8. A process according to any one of claims 1-4, wherein the side stream is heated by the use of steam to facilitate gasification of the urea.

9. A process according to any one of claims 1-4, wherein the side stream is passed through a mixing device prior to introducing said side stream of gases containing the gases resulting from the gasification of the urea into said primary stream of NO_x-containing gases to create said combined gas stream.

10. A process according to any one of claims 1-4, wherein urea is introduced into the side stream following passage of the gases therein through particulate reduction means.

11. A process according to any one of claims 1-4, wherein the urea is a solid reagent.

12. A process according to any one of claims 1-4, wherein said side steam of gases is heated to a temperature of at least 200°C prior to introducing the aqueous solution of urea having a concentration of from 5 to 70% at a rate relative to the NO_x concentration in said combined stream prior to passage through said NO_x-reducing catalyst effective to provide an NSR of from 0.1 to 2.0, and the side stream is passed through a mixing device prior to introducing said side stream of gases containing the gases resulting from the gasification of the urea into said primary stream of NO_x-containing gases to create said combined gas stream.

13. A process according to any one of claims 1-4, wherein said side steam of gases comprises less than 10% of the volume of the combined gas stream under standard conditions.

14. A process for reducing the concentration of nitrogen oxides in a stream of combustion gases, comprising:

providing a side stream of gases at a temperature of at least 200°C, said side stream comprising combustion gases separated from a combustion gas stream to produce said side stream and a primary stream, wherein said side stream of gases comprises less than 10% of the volume of the combustion gases under standard conditions;

introducing an aqueous solution of urea into said side stream under conditions effective to gasify said aqueous urea, said urea having a concentration of from 5 to 70% and is introduced at a rate relative to the NO_x concentration in said combined stream prior to passage through said NO_x-reducing catalyst effective to provide an NSR of from 0.1 to 2.0;

introducing said side stream of gases containing the gases resulting from the gasification of the urea into said primary stream of NO_x-containing gases of greater volume than the side stream to create a combined gas stream; and

passing the combined gas stream through a NO_x-reducing catalyst under conditions effective to reduce the concentration of NO_x in the combined gas stream.

15. A process for reducing the concentration of nitrogen oxides in a stream of combustion gases, comprising:

providing a side stream of gases at a temperature of at least 200°C, said side stream comprising combustion gases separated from a combustion gas stream to produce said side stream and a primary stream, wherein said side stream of gases comprises less than 10% of the volume of the combustion gases under standard conditions;

introducing an aqueous solution of urea into said side stream under conditions effective to gasify said aqueous urea, said urea having a concentration of from 5 to 70% and is introduced at a rate relative to the NO_x concentration in said combined stream prior

to passage through said NO_x-reducing catalyst effective to provide an NSR of from 0.1 to 2.0;

introducing said side stream of gases containing the gases resulting from the gasification of the urea into said primary stream of NO_x-containing gases of greater volume than the side stream to create a combined gas stream; and

passing the combined gas stream through a NO_x-reducing catalyst under conditions effective to reduce the concentration of NO_x in the combined gas stream;

wherein said combustion gases comprised in said side stream are separated from said combined gas stream following passage through the NO_x-reducing catalyst.

16. A process for reducing the concentration of nitrogen oxides in a stream of combustion gases, comprising:

providing a side stream of gases at a temperature of at least 200°C, wherein said side stream of gases comprises less than 10% of the volume of the combustion gases under standard conditions and are supplied from a source external of the combustion gases;

introducing an aqueous solution of urea into said side stream under conditions effective to gasify said aqueous urea, said urea having a concentration of from 15 to 70% and is introduced at a rate relative to the NO_x concentration in said combined stream prior to passage through said NO_x-reducing catalyst effective to provide an NSR of from 0.1 to 2.0;

introducing said side stream of gases containing the gases resulting from the gasification of the urea into said primary stream of NO_x-containing gases of greater volume than the side stream to create a combined gas stream; and

passing the combined gas stream through a NO_x-reducing catalyst under conditions effective to reduce the concentration of NO_x in the combined gas stream.

17. An apparatus for reducing the concentration of nitrogen oxides in a stream of combustion gases, comprising:

conduit means for transporting a side stream of gases at a temperature of at least 140°C;

means for introducing an aqueous solution of NO_x-reducing agent into said side stream under conditions effective to gasify said aqueous NO_x-reducing agent;

means for introducing said side stream of gases containing the gases resulting from the gasification of the NO_x-reducing agent into a primary stream of NO_x-containing gases of greater volume than the side stream to create a combined gas stream; and

means for passing the combined gas stream through a NO_x-reducing catalyst under conditions effective to reduce the concentration of NO_x in the combined gas stream.

18. An apparatus according to claim 17, wherein means are provided for separating the side stream from a combustion gas stream to produce said side stream and said primary stream.

19. An apparatus according to claim 17, wherein means are provided for introducing outside air as the side stream.

20. An apparatus according to claim 17, wherein means are provided for withdrawing gases from said combined gas stream following their passage through said NO_x-reducing catalyst to form said side stream.

21. An apparatus according to any one of claim 17-20, wherein means are provided to heat said side steam of gases to a temperature of at least 200°C prior to introducing the aqueous solution of urea.

22. An apparatus according to any one of claim 17-20, wherein means are provided to introduce a urea solution at a rate relative to the NO_x concentration in said combined stream prior to passage through said NO_x-reducing catalyst effective to provide an NSR of from 0.1 to 2.0.

23. An apparatus according to any one of claim 17-20, wherein means are provided to introduce a urea solution at a concentration of from 5 to 70%.

24. An apparatus according to any one of claim 17-20, wherein means are provided to heat the side stream by the steam to facilitate gasification of the NO_x-reducing agent.

25. An apparatus according to any one of claim 17-20, wherein mixing means are provided in said side stream of gases.

26. An apparatus according to any one of claims 17-20 which further comprises particulate removal means and the side stream is withdrawn from the effluent downstream of said particulate removal means.

27. A process according to any one of claims 17-20 wherein urea is a solid reagent.